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| 10/723,397 | 11/26/2003 | Shih-Jong J. Lee | SV31 | 8873 |
| 29738 | 7590 | 03/26/2008 | | |
| SHIH-JONG J. LEE 15418 SE 53RD PLACE BELLEVUE, WA 98006 | | | | |
| EXAMINER | | | | |
| BITAR, NANCY | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/723,397

Applicant(s)

LEE ET AL.

Examiner

NANCY BITAR

Art Unit

2624

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,6,11,14,17,20 and 23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,6,11,14,17,20 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 11/26/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
2. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 6 defines “maximum allowable value for a pixel and multiple within” it is not clear what element or feature is further defined by the claim. The word multiple is not followed by ant word or terms defining what it pertains to.

Claim Objections

3. Claim 17 is objected to because of the following informalities: in claim 17 step (c) the word "or" is repeated twice. Appropriate correction is required.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1, 14, 17, and 20 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-6 of U.S. Patent No. 7,110,603 B2.

Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

| Claims 1 of U.S. No.7,110,603 B2 | Claim 1 of this application 10/723397 |
|--|---|
| A fast decomposition and synthesis invariant matching method | A fast high precision matching method |
| a) Input an image; | a) Input an image; |
| b) Input a pattern template; | b) Input a template; |
| c) Perform fast decomposition and synthesis invariant pattern search using the input image and the pattern template to create a match result output; | c) Perform initial search using the input image and the template to create an initial search result output; |
| d) Perform refined invariant | d) Create high precision matching function by interpolating the matching function making it as a function of subpixel values or invariant high precision parameters |
| match using the match result and the pattern template to create a refined invariant match result output wherein the refined invariant match includes an affine transformation using the match result values. | e) Perform high precision match using the initial search result, the input image, and the template to create a high precision match result output. |

Claim 1 of the instant application and 1 of the patent recite common subject matter. Note the comparison above; claim 1 of the instant application is not patentability distinct from claims 1 of the U.S. Patent No. 7,110,603 B2. It would have been obvious to apply the affine transformation that includes rotation, shifting, scaling, translation, and determines the pixel from the input image corresponding to different (x, y) location in the pattern template therefore the pixel values can be derived by the interpolation method and would result in the function maximization.

As to independent claims 14 and 17 and 20 these claims are analyzed as previously discussed with respect to independent claim 14 since additional limitation "interpolating matching function" is met by the limitation "the refined invariant match" of claims 1 of the U.S. Patent No. 7,110,603 B2 where the refined invariant match is explained more with respect to the interpolation in (col 12, lines 1-43 of the patent application US 7,110,603 B2).

Examiner Notes

6. Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner

Claim Rejections - 35 USC 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1,6,11, 14,17,20,23 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kurosawa et al (U.S. Patent 4,972,499), Silver et al (U.S. Patent 7,164,796) and McConnell (U.S. Patent 4,567,610)

As to claim 1, Kurosawa teaches a fast high precision matching method comprising the steps of:

- a) Input an image (figure 1, element 12, column 3, lines 39-40);
- b) Input a template (column 4, lines 8-13, note that in figure 2 all the references templates are located in the database);
- c) Perform initial search using the input image and the template based on a matching function to create an initial search result output (figure 1, element 18 and 22, column 3, lines 51-62);
- d) create high precision matching function by interpolating the matching function making it as a function of subpixel values or invariant high precision parameters

d) Perform high precision match by high precision matching function maximization directly using the initial search result, from the step (c) the input image, and the same template from step (b) to create a high precision match result output (figure 1, element 24 and 26, column 4, lines 62-67, column 4, lines 1-21).

Kurosawa is silent about using invariant pattern search. However, McConnell discloses invariant pattern search (fig 2a -c and 3a-d and column 8, lines 36- 59, column 9, lines 30-49, the invariant search are comparing test and reference histograms, note, "invariant profile "describe on page 6 and 7 of the detailed description of the invention, see McConell fig 2a -c and 3a - d and column 8, lines 36- 59, column 9, lines 30-49)).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Kurosawa by the teaching of McConnell because to map objects having characteristic radial features to determine orientation and for identification to improve the flexibility of the recognition system (as suggested by McConnell at column 9, lines 67-68, column 10, lines 1- 2, the output signal from the CPU, see equation 9, is the image output also see column 11, lines 4-41, the histograms that are generated are use to calculate the entropy being use for matching process). Neither Kurosawa nor McConnell discloses the match as being high precision.

Specifically, Silver et al. teaches the "perfect fit" that correspond to the best match of the search result the initial image (image 130) and the template image (training image 100) in order to get a location accuracy and a highest degree of match (column 10, lines 24-52); Because the perfect fit help in identifying differences between a stored pattern and a matching image subset, where variations in pattern position, orientation, and size do not give rise to false differences. It would have been obvious to one of ordinary skill in the art to use pattern inspection of an image in

Kurasawa matching method in order to minimize the false differences between the pattern and image that can limit inspection performance (column 5, lines 50-62) thus resulting in an overall method for pattern inspection that is faster and more accurate. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 6, Silver et al. teaches the method of claim 1 wherein the high precision match step performs robust matching limits pixel contribution with maximum allowable value for a pixel and multiple within one pixel range high precision matches can be used if the initial search includes multiple candidate positions. (Gray-level pixel-grid-based methods are used for pattern inspection, column 3, lines 38-51).

As to claims 11, teaches the method of claim 2 wherein the matching function maximization uses an iterative method for the sub pixel values or invariant high precision parameter is performed using optimization methods (figures 22-25).

The limitation of claim 14 has been addressed in claims 1

The limitation of claims 17 and 20 and 23 has been addressed above except for profile generation. McConnell teaches this limitation (invariant profile generation; pages 6 and 7 of the details description of the invention, figure 2a-c and 3a-d and column 8, lines 36-59, column 9, lines 30-49) in order to create an invariant high precision match result output (see McConnell figure 1, 9-34 and column 13, lines 47-67, the histogram that are generated are used to calculate the entropy being use for the matching process. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kurosawa to include (invariant image and template profile generation). It would have been obvious to one of ordinary skill in

the art at the time of the invention to have modified Kurosawa by the teaching of McConnell, which is the generation of invariant profiles because to map objects having characteristic radial features to determine orientation and for identification to improve the flexibility of the recognition system (as suggested by McConnell at column 9, lines 66-67, column 10, lines 1-2).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NANCY BITAR whose telephone number is (571)270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Andrew W. Johns/
Primary Examiner, Art Unit 2624

Nancy Bitar

3/21/2008

